

The Differential Effects of Exogenous and Endogenous Uncertainty on the Value of a Joint Venture

This study employs a stochastic model to investigate how uncertainty of different types (i.e., exogenous and endogenous) affects the value of a joint venture (JV). The model examines three scenarios.

- ❖ Scenario 1: The realized profitability of the JV is assumed to be uncertain and evolve stochastically, but the abilities of the two JV partners to generate rent from the JV's assets on their own are assumed to move in a perfectly synchronous fashion (i.e., remain equal). This implies two conditions:
 - The JV and the two partners face only exogenous market uncertainty.
 - There is complete symmetry in capabilities between the two partners.
- ❖ Scenario 2: The capabilities of the JV partners are assumed to evolve stochastically but perfectly correlated, i.e., their abilities to generate rent from the JV on their own always move up or down at the same time. However, their capabilities also diverge in a deterministic manner in the sense that whenever one party's ability increases (decreases), the other party's ability increases to a greater extent (decreases to a smaller extent). This implies two conditions:
 - The uncertainty is still completely exogenous.
 - There exists a form of capability asymmetry between the two partners, but the asymmetry is completely deterministic in the sense that it can be perfectly predicted on the basis of the exogenous uncertainty.
- ❖ Scenario 3: The capabilities of the JV partners are assumed to evolve stochastically without the restriction of perfect correlation, i.e., their abilities to generate rent from the JV on their own can diverge randomly. As the coefficient of correlation between their capabilities varies from 1 to 0, the nature of uncertainty changes from 100% exogenous (completely due to unpredictable market conditions) to 100% endogenous (completely due to the random divergence of partner capabilities without any common component).

The results allow us to make the following propositions:

1. Exogenous uncertainty adds no more value to a JV than to a sole venture by either party.
2. Exogenous uncertainty combined with deterministic divergence of capabilities adds no more value to a JV than to a sole venture by the more capable party.
3. Endogenous uncertainty alone without any predictable divergence of capabilities adds value to the JV.

The results demonstrate that endogenous uncertainty is a necessary condition for a JV to have any option value embedded, refuting the argument that JV partners only respond to exogenous uncertainty but not to endogenous uncertainty.